

Write an equation for each sequence.

linear

x	0	5	6	7
y		10	14	18

1. $y = 4x - 10$

$$4(5) + b = 10$$

$$20 + b = 10 \quad b = -10$$

Given the function $f(x) = 5x^2 - 2x + 3$ find the value of each expression below.

3. $f(4)$

$$= 75$$

$$5(4)^2 - 2(4) + 3$$

$$5 \cdot 16 - 8 + 3$$

$$80 - 8 + 3$$

$$75$$

4. $f(-3)$

$$5(-3)^2 - 2(-3) + 3$$

$$5 \cdot 9 + 6 + 3$$

$$45 + 6 + 3$$

$$54$$

Factor each of the following quadratics.

5. $x^2 - 5x - 6$

$$(x - 6)(x + 1)$$

$$-6x + 1x$$

6. $x^2 - 5x + 6$

$$(x - 3)(x - 2)$$

$$-3x - 2x$$

$$(7) \sqrt{8x^2 - 98}$$

★ difference of squares

$$(\sqrt{8x} - \sqrt{98})(\sqrt{8x} + \sqrt{98})$$

8) Write $y = x^2 + 12x - 5$ in graphing form by completing the square.

$$x^2 + 12x + 36 - 5 - 36$$

$$\div 2 \quad b^2 = 36$$

$$y = (x + 6)^2 - 41$$

Write the equation for each parabola below.

9) A parabola with the same shape as $y = x^2$ but shifted 5 units to the left and 7 units up.

$$h = -5 \quad k = 7$$

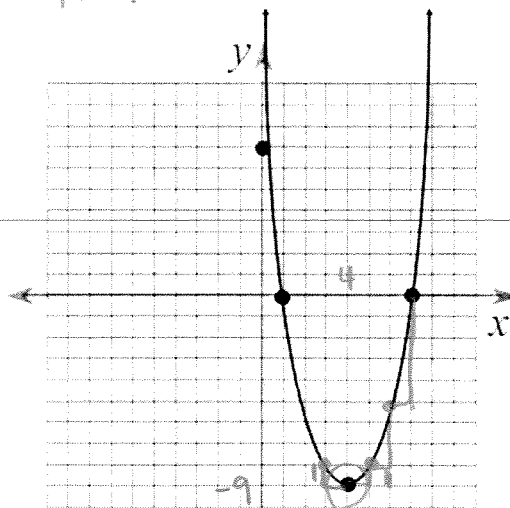
$$y = (x + 5)^2 + 7$$

10) The parabola shown in the graph on the right.

$$y = (x - 4)^2 - 9$$

vertex: $(4, -9)$

$$a = 1$$

11) Give the coordinates of the **vertex** of $y = x^2 - 8x + 11$

$$(4, -5)$$

$$x = \frac{8}{2} = 4$$

$$y = 4^2 - 8(4) + 11$$

$$16 - 32 + 11$$

$$-16 + 11 = -5$$

factor → last term (c)

Find the x and y-intercepts.

12) $y = x^2 - 3x - 40$ ^{10 - 8}
 $0 = (x - 8)(x + 5)$
 $x = 8 \quad x = -5$

x intercepts (8,0) (-5,0)
 y intercept (0,-40)

13) $y = x^2 - 49$
 $(x + 7)(x - 7) = 0$
 $x = -7 \quad x = 7$

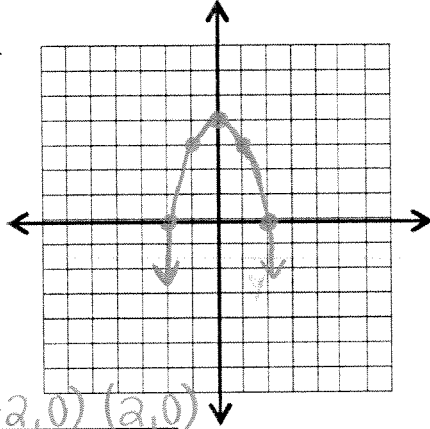
x intercepts (-7,0) (7,0)
 y intercept (0,-49)

14) $y = 3x^2 + 17x + 20$ ^{3 · 20 = 60}
 $(3x + 5)(x + 4)$ ^{6 10}
 $x = -\frac{5}{3} \quad x = -4$ ^{5 + 10 = 15}

x intercepts (-5/3,0) (-4,0)
 y intercept (0,20)

Graph each parabola. List the x and y intercepts and the vertex.

15) $y = -x^2 + 4$



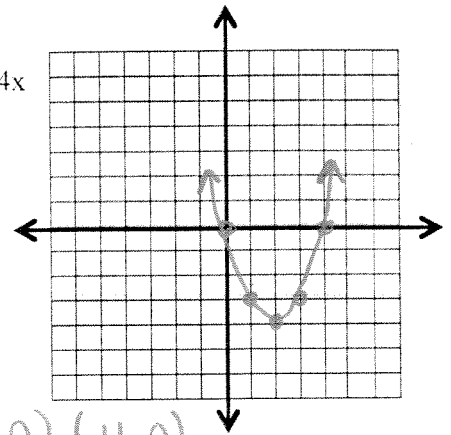
x intercepts (-2,0) (2,0)

y intercept (0,4)

vertex (0,4)

16) $y = x^2 - 4x$

x	y
0	0
1	-3
2	-4
3	-3
4	0



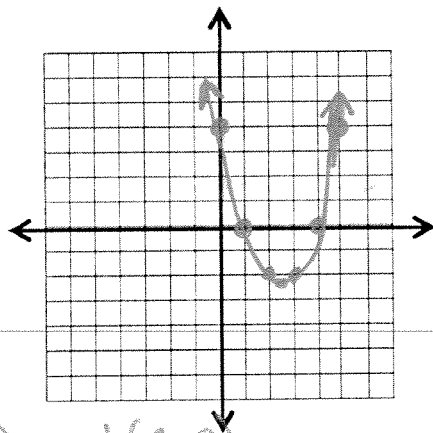
x intercepts (0,0) (4,0)

y intercept (0,0)

vertex (2,-4)
 $\frac{4}{2} = 2$

17) $y = x^2 - 5x + 4$

x	y
1	0
2	-2
2.5	-2.25
3	-2
4	0



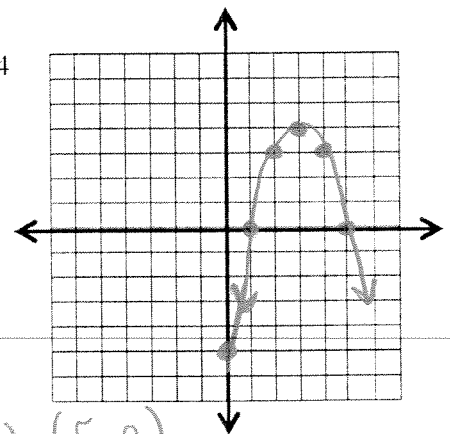
x intercepts (1,0) and (4,0)

y intercept (0,4)

vertex (2.5, -2.25)
 $\frac{5}{2} = 2.5$

18) $y = -(x - 3)^2 + 4$

x	y
1	0
2	3
3	4
4	3
5	0



x intercepts (1,0) (5,0)

y intercept (0,-5)

vertex (3,4)